

PRECIPITATION.

The average monthly precipitation for California for May is as follows:

Year.	Mean.	Departure.	Year.	Mean.	Departure.
	<i>Inches.</i>	<i>Inches.</i>		<i>Inches.</i>	<i>Inches.</i>
1907.....	0.18	-1.16	1905.....	2.18	+ .84
1908.....	1.56	+0.22	1906.....	3.19	+1.85
1909.....	0.73	-0.61	1907.....	.57	-0.77
1900.....	1.39	+0.05	1908.....	1.63	+ .29
1901.....	1.03	-0.31	1909.....	.23	-1.11
1902.....	0.84	-0.50	1910.....	.18	-1.16
1903.....	0.14	-1.20	1911.....	.72	-0.62
1904.....	0.22	-1.12			

The greatest 24-hour precipitation was 1.65 inches at Weitchpec, and the greatest monthly amount was 6.78 inches, also at Weitchpec. There was practically no rain in the southern counties.

SUNSHINE.

The following table gives the total hours of sunshine and percentages of possible:

Stations.	Hours.	Per cent of possible.	Stations.	Hours.	Per cent of possible.
Eureka.....	187	42	Sacramento.....	288	66
Fresno.....	394	90	San Diego.....		
Los Angeles.....	304	70	San Francisco.....	257	58
Mount Tamapais.....	309	70	San Jose.....	343	78
Red Bluff.....	325	73	San Luis Obispo.....	259	59

There was less sunshine at the coast stations than usually occurs in May. At San Francisco, for example, the percentage was lower than in any year since 1891.

LOCAL STORMS.

May 23, a windstorm early in the morning did considerable damage to fruit and vegetation in the San Joaquin Valley. At Stockton signs were blown down and it became necessary to shut off the electric current used for lighting. A fire wall on San Joaquin Street was blown down and two persons slightly injured.

In Sacramento the wind reached a velocity of 40 miles an hour from the south, but aside from dust carried by the high wind and the blowing down of signs not properly fastened there was no damage done.

NOTES ON THE RIVERS OF THE SACRAMENTO AND SAN JOAQUIN WATERSHEDS FOR MAY, 1911.

By N. R. TAYLOR, Local Forecaster.

The Sacramento watershed.—The rivers of this watershed were exceptionally high during the entire month, with but little difference between the highest and lowest stages.

At the close of April the snow fields of the high Sierra were unusually extensive, and well-packed snow ranging in depth from 5 to over 10 feet was general above the 5,500-foot level. The slow melting of this snow during May caused a continuation of high stages in all of the larger streams, but kept the smaller mountain water-courses below the danger point. No freshets were reported from any section of the Sacramento Valley during the month.

In the Sacramento River above Redding there was little departure from the stages usually maintained during the month in question; but from Red Bluff to the mouth of the river this stream averaged from 1 foot to over 2 feet above the normal for the month. At Red Bluff, Colusa, Knights Landing, and Sacramento City the river averaged 1.2, 2.2, 2.1, and 1.7 feet, respectively, above the normal stages, and at all these points the river was higher than during any May since that of 1907.

The San Joaquin watershed.—All streams in this watershed carried more than the usual amount of water. At Firebaugh, on the San Joaquin, the river averaged higher than for any May since that of 1907, and at Melones, on the Stanislaus, the average stage of the river was the highest ever known for any month since the records have been kept.

PROTECTION AGAINST FROST—FROST CANDLES.

By A. G. McADIE.

In an effort to improve upon present frost-fighting apparatus there has been devised at the San Francisco Weather Bureau office an inexpensive frost candle. It has also been called a frost cartridge, because of a fancied resemblance to a large cartridge. The device consists of two portions, the lower or cartridge proper, and an upper metallic screen or cover. The cartridge consists of a cardboard or stiff paper tube of suitable dimensions filled with combustible material. In actual practice, mailing tubes, about 12 inches long and 1½ inches in diameter, are used for the smaller size. For the larger size the dimensions may be doubled. The tube is filled with cotton waste or other suitable wicking and either crude oil or distillate. A stopper is provided for the lower end, but with a little experience the cotton waste may be so packed as to prevent any leakage of oil. A projecting end of the cotton waste serves as a ready means of lighting.

About 6 inches above the cartridge is a metallic cover, which is simply a sheet of thin metal, iron or tin, 20 inches long and 14 inches wide, cut along diagonal lines at each corner about 3½ inches. The ends are then bent downward making an inverted pan, the sides of which flare outward. The purpose of the inverted pan is to catch and hold a certain amount of the heated air rising from the burning end of the cartridge. It also serves to catch and hold the soot particles as they rise in the smoke. In burning crude oil the carbon is very noticeable and some means is necessary to prevent its settling on the fruit. The cover becoming heated will retain its heat longer than a screen of different shape, owing to its box-like character. Moreover the top surface, metallic, will radiate heat upward to the fruit a few inches above. This heat is preferable to the convectional heat from the naked flame, as it will not scorch or singe the boughs, leaves, or fruit.

The cartridge is held in place by a series of small loops made of wire, fastened to the edge of the cover. Three of these holding loops are sufficient. The whole device, cartridge and cover, is hung under the tree, suspended from a bough by one or more wire hooks. The distance from the bough can be varied at will from a few inches to several feet. Preferably about 4 inches below the bough will answer.

The cartridges may be filled during the afternoon hours and set in their cradles. When the temperature falls to the danger point a man can pass through the orchard and with a small, flaming torch rapidly light the upper ends of the cartridges, which should burn gradually and